

**Orthographic projection of Plane Surfaces (Module 1 )**

1. An equilateral triangular lamina of 40 mm side lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 45 degrees. The edge on which it rests is inclined to VP at 60 degrees. Draw the projections and find the distance of the corner opposite to the resting side from HP.
2. An equilateral triangular lamina of 40 mm side lies on one of its sides on HP. The lamina makes  $45^{\circ}$  with HP and one of its medians is inclined at  $40^{\circ}$  to VP. Draw its projections and determine the apparent length of the resting side in front view.
3. An equilateral triangular lamina of 30 mm sides is resting on HP with one of its corners such that the side opposite to the resting corner is 20 mm above HP and makes an angle of 40 degrees to VP. Draw the projections and determine the inclination of the lamina with HP.
4. A square lamina of 40 mm side rests on one of its sides on HP. The lamina makes 30 degrees to HP & the side on which it rests makes 45 degrees to VP. Draw its projections.
5. A square plate of 30 mm sides rests on HP such that one of the diagonals is inclined at  $30^{\circ}$  to HP and  $45^{\circ}$  to VP. Draw its projections
6. A rectangular lamina of sides 40 mm x 25 mm rests on HP on one of its shorter edges. The lamina is rotated about the side on which it rests till it appears as square in the top view. The side on which the lamina rests is inclined at 30 degrees to VP. Draw its projections and determine the inclination of the lamina with HP.
7. A pentagonal lamina of edges 25 mm is resting on HP with one of its sides such that the surface makes an angle 60 degrees with HP. The edge on which it rests is inclined at 45 degrees to VP. Draw its projections.
8. A pentagonal lamina having edges 30 mm is placed on one of its corner on HP such the surface makes an angle 30 degrees with HP and the perpendicular bisector of the edge passing through the corner on which the lamina rest is inclined at 45 degrees to VP. Draw the front & top view of the lamina.
9. A pentagonal lamina of sides 30 mm is having a side both on HP and VP. The surface of the lamina is inclined at an angle of  $60^{\circ}$  with HP. Draw the top and front views of the lamina.
10. A pentagonal lamina of edges 30 mm is resting on HP with one of its corners such that the edge opposite to this corner is 20 mm above HP, which also make an angle of 45 degrees with VP. Draw the projections of the lamina and find its surface inclination with HP.
11. A regular hexagonal lamina of sides 30 mm lying in such a way that one of its sides touches both the reference planes. If the lamina makes 60 degrees with HP, draw the projections of the lamina.
12. A hexagonal lamina of sides 25 mm rests on one of its sides on HP. The lamina makes 45 degrees to HP & the side on which it rests makes 30 degrees to VP. Draw its projections.
13. Draw the top view and front view of a hexagonal lamina of 30 mm sides having two of its edges parallel to both HP and VP and one its edges is 20 mm from each of the reference planes. The surface of the lamina is inclined at 50 degrees to HP.

14. A hexagonal lamina of sides 30 mm is lying in such a way that one of its corners is in HP and the corner opposite to this resting corner is touching VP. If the lamina makes 45 degrees HP, draw the projections of the lamina.
15. A circular lamina of 50 mm diameter rests on HP such that one of its diameters is inclined at 30 degrees to VP & 45 degrees to HP. Draw its top & front view.

## CAED Question Bank on Projection of Solids (Module 2 )

1.	A square prism 30 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 degrees. Draw the projections of the prism when the axis of the prism is inclined to HP at 45 degrees. Also determine the apparent inclination of the axis with VP.
2.	A square prism 30 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests makes equal inclination with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 degrees and appears to be inclined at 45 degrees to VP.
3.	A pentagonal prism 25 mm sides of base and 60 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 degrees. Draw the projections of the prism when the axis is inclined to HP at 40 degrees.
4.	A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its edges. Draw the projections of the prism when the axis is inclined to HP at 45 degrees and appears to be inclined to VP at 40 degrees. Also determine the true inclination of the axis with VP.
5.	A square pyramid 30 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45 degrees and VP at 30 degrees.
6.	A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40 degrees and appears to be inclined to VP 45 degrees. Also determine the true inclination of the axis with VP.
7.	A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges. Draw the projections of the pyramid when the axis is inclined to HP at 45 degrees and appears to be inclined to VP at 40 degrees. Also determine the true inclination of the axis with VP.
8.	A cone of 50 mm base diameter and 60 mm axis length rests on HP on a point on the circumference of its base such that the apex is at 40 mm above HP and the axis appears to be at 60 degrees to VP. Draw the projections of the cone.
9.	A square pyramid of base side 30 mm and axis height 60 mm rests on HP on one of its edges of the base such that the apex of the pyramid is at height of 50 mm above HP and the axis is inclined to VP by 40 degrees. Draw the projections of the pyramid and determine the inclination of the axis with HP.
10.	A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of its base such that the two base edge containing the resting corner makes equal inclination with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined at 40 degrees to HP and 30 degrees to VP.

11.	A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45 degrees. Also determine the angle axis makes with VP.
12.	A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45 degrees and the base is nearer to the observer.
13.	A tetrahedron of 50 mm sides rests on one of its corners such that the edge containing that corner is inclined to HP at 50 degrees and VP at 30 degrees. Draw the projections.
14.	A hexahedron of 30 mm sides is resting on one of its corners on HP such that one of its solid diagonals is perpendicular to VP. Draw the projections of the solid.
15.	A cone of base diameter 40 mm and axis length 55 mm is resting on HP on a point on the circumference of its base such that its apex is at 40 mm above HP and its topview of the axis is inclined at 60 degrees to VP. Draw the projections and determine the inclination of the axis with HP when the base is nearer to the observer.
16.	A cone of base diameter 40 mm and axis height 50 mm resting on HP such that one of its generators is parallel to HP. Draw the projections of the solid when the top view of the axis is inclined at 45 degrees to VP.
17.	A square pyramid 30 mm base side and axis 60 mm long, has its slant triangular face on HP and the axis makes an angle of 45 degrees with the VP. Draw its projections assuming the apex to be nearer to VP. Also determine the inclination of the axis with HP.
18.	A pentagonal pyramid of base side 25 mm and axis length 60 mm is resting on one of its base edges on HP. The solid is tilted about its resting edge till its apex is 40 mm above HP. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45 degrees.
19.	A hexagonal prism of base side 25 mm and axis length 50 mm rests on HP on one of its rectangular faces such that the axis appears to be inclined to VP by 40 degrees. Draw the projections of the prism.
20.	A square pyramid of 30 mm base side and 60 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid assuming the apex to be nearer to the observer and the axis of the pyramid is inclined at 40 degrees to VP.

## CAED Question Bank on Isometric Projections (Module- 3)

1.	A hemisphere of 60 mm diameter is supported co-axially on the vertex of the cone of base diameter 60 mm and axis length 60 mm. The flat circular face of the hemisphere is facing upside. Draw the isometric projection of the combination solid.
2.	Draw the isometric projection of a rectangular prism of 70 x 80 x 20 mm surmounting a tetrahedron of sides 60 mm such that the axes of the solids are collinear and at least one of the edges of both the solids are parallel.
3.	The frustum of a square pyramid of base side 40 mm, top side 20 mm and height 50 mm rests on the center of a square block of sides 50 mm and height 30 mm. The base edges of both the solids are parallel. Draw the isometric projection of the combination solid.
4.	A square pyramid of base side 40 mm and height 50 mm rests symmetrically on a cube of edges 50 mm. Draw the isometric projection of the combination solid if axes of the solids are in common line.
5.	A hemisphere of diameter 50 mm rests centrally over a frustum of a cone of base diameter 80 mm, top diameter 50 mm and height 50 mm. Draw the isometric projection of the combination.
6.	A square prism of base side 40 mm and height 50 mm is placed centrally on a cylindrical slab of 100 mm diameter and 30 mm thickness. Draw the isometric projection of the combination.
7.	A hemisphere of diameter 60 mm is placed on the ground on its curved surface. A cone of base diameter 60 mm and height 60 mm is placed centrally on it. Draw the isometric projection of the combination.
8.	A cone of base diameter 60 mm and height 50 mm is placed centrally on the top face of a square prism of base side 60 mm and height 50 mm. Draw the isometric projection of the combination.
9.	A triangular pyramid of base side 40 mm and height 50 mm is placed centrally on a square slab of base side 80 mm and thickness 30 mm. Draw the isometric projection of the combination.
10.	A hollow cylinder of diameter 60 mm, thickness 10 mm and height 60 mm is placed centrally on an equilateral triangular prism of side 100 mm and thickness 30 mm. Draw the isometric projection of the combination.
11.	A hollow square prism of base side 60 mm, thickness 10 mm and height 50 mm is placed centrally on cylinder of base diameter 80 mm and thickness 30 mm such that the axes of the two solids are collinear. Draw the isometric projection of the combination.
12.	A pentagonal pyramid of base side 30 mm and height 60 mm is placed centrally on a rectangular slab 100 x 60 mm and 30 mm thickness. Draw the isometric projection of the combination solid.
13.	Three cubes of sides 80 mm, 60 mm and 40 mm are placed centrally one above the other in such a way that the bigger cube is at the bottom and second bigger cube at the middle and smaller cube at the top. Draw the isometric projection of the combination.

14.	A square prism of base side 40 mm and height 80 mm is resting on its rectangular face on top of the square slab of sides 80 mm and 30 mm thickness. Draw the isometric projection of the combination.
15.	A cube of side 30 mm is placed centrally on a rectangular slab of 100 mm x 60 mm and thickness 30 mm. Draw the isometric projection of the combination solid

## CAED Question Bank on Development of Surfaces (Module -4)

1.	A square prism of base side 30 mm and axis length 50 mm is resting on HP on its base with two of its vertical faces perpendicular to VP. It is cut by a section plane inclined at 40 degrees to HP and perpendicular to VP and passing at a distance of 30 mm from the base along the axis. Draw the development of the lower portion of the prism.
2.	A pentagonal pyramid of base side 25 mm and altitude 50 mm is resting on HP on its base with an edge of the base perpendicular to VP. The pyramid is cut by a section plane inclined at 30 degree to HP, perpendicular to VP and bisecting the axis. Draw the development of the lower portion of the pyramid.
3.	A hexagonal prism of base side 25 mm and axis length 60 mm is resting on HP on its base with two of its vertical faces perpendicular to VP. It is cut by a section plane inclined at 45 degrees to HP and perpendicular to VP and bisecting the axis. Draw the development of the lower portion of the prism.
4.	A frustum of a square pyramid has its base its base 50 mm sides, top side 25 mm and height 60 mm. Its axis is vertical and a side of its base is parallel to VP. Draw the development of the lateral surface of the frustum.
5.	A hexagonal pyramid of base side 40 mm and altitude 70 mm is resting on HP on its base with two of the base edges perpendicular to VP. The pyramid is cut by a section plane inclined at 30 degree to HP, perpendicular to VP and intersecting the axis at 40 mm above the base. Draw the development of the remaining portion of the pyramid.
6.	A vertical cylinder of base diameter 50 mm and axis length 70 mm is cut by a section plane perpendicular to VP, inclined at 50 degree to HP and passing through the mid point of the axis. Draw the development of the lateral surface of the cylinder.
7.	A cone base diameter 50 mm and axis length 70 mm is cut by a section plane perpendicular to VP, inclined at 40 degree to HP and passing at a point 20 mm along the axis from the apex. Draw the development of the lateral surface of the cone.
8.	Draw the development of the lateral surface of the funnel consisting of a cylinder and frustum of a cone. The diameter of the cylinder is 30 mm and top face diameter of the funnel is 90 mm. The height of the frustum of the cone and cylinder are equal to 60 mm and 20 mm respectively.
9.	Draw the development of a frustum of a cone of base diameter 70 mm, top diameter 40mm and height 50 mm.
10.	A rectangular prism of base side 20 mm x 40 mm and axis length 60 mm is resting on HP on its base such that the longer edge is parallel to VP. It is cut by a section plane inclined at 40 degrees to HP, perpendicular to VP and passing through midpoint of the axis. Draw the development of the truncated prism